

REMARKS

Claim 53 has been cancelled. Thus, claims 48 - 49, 51-52, 54- 55, 59, 65, 66, 68 and 69 are pending in the application. Claim 52 has been amended. In view of the above amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable.

Claims 52, 55 and 65 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,357,957 to Iitl et al. ("Iitl"). Claim 52 was amended to incorporate the subject matter of claim 53 which depended therefrom.

Claim 52 recites a medical system for analyzing brain waves of a subject at a location remote from the subject comprising "an EEG (electroencephalograph) electrode for detecting brain waves of the subject" and "attachment means coupled to the electrode and removably attaching the electrode to a head of the subject" in combination with "an amplifier connected to the electrode for amplifying the detected brain waves" and "a transmitter situated on the attachment means and broadcasting a signal based on the amplified brain waves" along with "a remote receiver receiving the brain wave signal" and "a selectively adjustable filter separating one of a single frequency band and a group of frequency bands from a brain wave frequency spectrum represented by the brain wave broadcast signal to generate a frequency band signal" and "an output device generating an output signal based on the frequency band signal for analysis by an operator to determine the existence of brain dysfunction" and "a processor analyzing the frequency band signal to determine the existence of brain dysfunction, wherein the output device generates an audible warning signal when the analysis of the frequency band signal is indicative of brain dysfunction."

In contrast, Iitl describes an EEG headset having multiple electrode assemblies that output electrical signals to a D-connector mounted on the headset. The D-connector is coupled to signal-conditioning hardware which includes "[a] CRT display...for display of selection parameters or the input signals for monitoring purposes." Iitl, col. 6, ll. 6-8. The signal conditioning hardware does not determine whether the electrical signals from the electrode assemblies are indicative of brain dysfunction, and, as a result, the CRT display cannot display a warning signal indicative of brain dysfunction. Thus, it is respectfully submitted that Iitl neither discloses nor suggests "a processor analyzing the frequency band signal to determine the existence of brain injury, wherein the output device generates an audible warning signal when

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the analysis of the frequency band signal is indicative of brain dysfunction," as recited in claim 52.

It is respectfully submitted that U.S. Patent No. 3,696,808 to John (identified in the rejection of claim 53 as Roy) does not cure the above-described deficiencies of Iitl. In John, results of a comparison of electrical signals from bilateral symmetrically positioned probes are shown on a final meter 142. John never discloses or suggests that the electrical signals are filtered to a single frequency band or a group of frequency bands within the brain wave frequency spectrum, or that an audible warning signal is provided when the signals on the selected band(s) are indicative of brain dysfunction.

Therefore, it is respectfully submitted that neither Iitl nor John either alone or in combination, discloses or suggests "a processor analyzing the frequency band signal to determine the existence of brain injury, wherein the output device generates an audible warning signal when the analysis of the frequency band signal is indicative of brain dysfunction," as recited in claim 52. Because claims 55 and 65 depend from, and, therefore include all of the limitations of claim 52, it is respectfully submitted that these claims are also allowable.

Claims 48, 49, 51 and 68 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,241,967 to Yasushi et al. ("Yasushi") in view of U.S. Patent No. 5,279,305 to Zimmerman et al. ("Zimmerman") and U.S. Patent No. 6,001,065 to DeVito. The Examiner states that Yasushi shows a device having an active electrode, a filter, and a tone generator for producing an audio output but does not disclose or suggest a radio transmitter or a connection means, but that these elements are shown in Zimmerman and DeVito, respectively.

Claim 48 recites a medical system to analyze brain waves of a subject, comprising a medical system to analyze brain waves of a subject comprising "an active EEG (electroencephalograph) electrode detecting a subject's analog brain waves" and a "connection means removably connecting the electrode to a subject's head" in combination with "an amplifier situated on the connection means, the amplifier amplifying the detected brain waves" and "a radio transmitter situated on the connection means, the radio transmitter generating a brain wave broadcast signal based on the detected analog brain waves, the radio transmitter broadcasting the brain wave broadcast signal" and further including "a receiver receiving and amplifying the brain wave broadcast signal" and "a selectively adjustable filter separating a frequency band from a group of frequency bands in the brain wave broadcast signal to generate a frequency

band signal" and a "sound generator coupled to the receiver, the sound generator converting the frequency band signal into a sound, corresponding to the analog brain waves."

In contrast, Yasushi describes a system for evoking a desired brain wave from a subject by utilizing a bandpass filter 4 which "passes only a signal corresponding to a brain wave desired to be evoked." Yasushi, col. 6, lines 7-8. Yasushi teaches only that the filter 4 may be set for a single brain wave frequency band, e.g., only alpha, only theta or only beta. *Id.* Thus, it is respectfully submitted that Yasushi does not disclose or suggest "a selectively adjustable filter separating a frequency band from a group of frequency bands in the brain wave broadcast signal to generate a frequency band signal" and a "sound generator coupled to the receiver, the sound generator converting the frequency band signal into a sound, corresponding to the analog brain waves" as recited in claim 48.

It is respectfully submitted that neither Zimmerman nor DeVito cures the above-described deficiencies of Yasushi. Zimmerman describes a transmitter 12 which is electrically connected to a plurality of electrodes 16 coupled to the patient's head. Radio frequency transmissions of the electrical signals generated by the electrodes 16 are transmitted to a receiver 14 which displays the signal from each electrode 16 on a display terminal. Zimmerman, col. 8, lines 28-41. No where does Zimmerman disclose or suggest filtering or displaying a frequency band selected from a group of frequency bands in the electrical signals from the electrodes 16.

DeVito describes a system for sensing and converting EEG signals into game-play commands. DeVito, col. 4, lines 35-49. Electrical signals generated by electrodes 23-25 are transmitted by a transmitter 30 in a headband 20 to a receiver 40, which performs numerous Fast Fourier Transforms on the signals. *Id.* While DeVito describes the use of a frequency filter for determining a power level within a preselected frequency band, the filter is not "selectively adjustable." In fact, the frequency filter extracts one particular frequency band from the electrical signals and discards the remaining portions. *Id.* at col. 8, lines 13-23. Thus, DeVito teaches away from the present invention by discarding non-selected frequency bands.

Therefore, applicants respectfully submit that neither Yasushi nor Zimmerman nor DeVito, either alone or in combination, discloses or suggests "a selectively adjustable filter separating one of a single frequency band and a group of frequency bands from a brain wave frequency spectrum represented by the brain wave broadcast signal to generate a frequency band signal" and a "sound generator coupled to the receiver, the sound generator converting the

frequency band signal into a sound, corresponding to the analog brain waves" as recited in claim 48. Because claims 49 and 51 depend from, and, therefore include all of the limitations of claim 48, it is respectfully submitted that these claims are also allowable.

Claim 68 recites limitations substantially similar to claim 48 including "selectively separating one of a single frequency band and a group of frequency bands from a brain wave frequency spectrum represented by the brain wave broadcast signal to generate a frequency band signal" and "generating a sound based on the frequency band signal using the hand-held receiver." Thus, it is respectfully submitted that claim 68 is also allowable for at least the same reasons stated above in regard to claim 48.

Claims 48, 49, 51 and 68 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Itil in view of U.S. Patent No. 4,454,886 to Lee. The Examiner states that Itil discloses the invention as claimed except for an audible output, but that this feature is disclosed in Lee.

As noted above and correctly recognized by the Examiner, Itil neither discloses or suggests a "sound generator coupled to the receiver, the sound generator converting the frequency band signal into a sound, corresponding to the analog brain waves." As recited in claim 48, the frequency band signal is a single frequency band or a group of frequency bands selectively filtered from a brain wave frequency spectrum in a brain wave broadcast signal. It is respectfully submitted that Lee does not cure the deficiencies of Itil.

Lee describes a method for generating a sound output signal 24 from brain waves of a patient. Each electrical signal generated by an electrode 14 is passed through a band-pass filter to exclude noise lying outside of a brain wave frequency band, e.g., 1-50Hz. The sound output signal 24 is a single signal which corresponds to the brainwaves for the entire brain wave frequency band. Thus, the sound output signal 24 does not represent the brainwaves of the patient in a particular frequency band (e.g., theta) or group of frequency bands (e.g., theta, alpha) selectively filtered from the brain wave frequency spectrum, as recited in the present invention. Thus, it is respectfully submitted that Lee does not disclose or suggest "a selectively adjustable filter separating one of a single frequency band and a group of frequency bands from a brain wave frequency spectrum represented by the brain wave broadcast signal to generate a frequency band signal" and a "sound generator coupled to the receiver, the sound generator converting the frequency band signal into a sound, corresponding to the analog brain waves" as recited in claim 48. Because claims 49 and 51 depend from, and, therefore include all of the

limitations of claim 48, it is respectfully submitted that these claims are also allowable.

Claim 68 recites limitations substantially similar to claim 48 including "selectively separating one of a single frequency band and a group of frequency bands from a brain wave frequency spectrum represented by the brain wave broadcast signal to generate a frequency band signal" and "generating a sound based on the frequency band signal using the hand-held receiver." Thus, it is respectfully submitted that claim 68 is also allowable for at least the same reasons stated above in regard to claim 48.

Claims 54 and 66 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Itil in view of Zimmerman. It is respectfully submitted that Zimmerman does not cure the above-described deficiencies of Itil. Thus, because claims 54 and 66 depend from, and, therefore include all of the limitations of claim 52, it is respectfully submitted that these claims are also allowable.

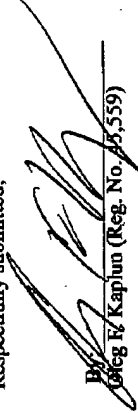
Claim 59 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Itil in view of Lee. It is respectfully submitted that Lee does not cure the above-described deficiencies of Itil. Thus, because claim 59 depends from, and, therefore includes all of the limitations of claim 52, it is respectfully submitted that this claim is also allowable.

Claim 69 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Itil in view of Lee in further view of U.S. Patent No. 4,454,886 to John. It is respectfully submitted that John does not cure the above-described deficiencies of Itil. Thus, because claim 69 depends from, and, therefore includes all of the limitations of claim 68, it is respectfully submitted that this claim is also allowable.

CONCLUSION

It is therefore respectfully submitted that all of the pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,



Greg H. Kaplun (Reg. No. 45,559)

Fay Kaplun & Marcin, LLP
150 Broadway, Suite 702
New York, NY 10038
Tel: (212) 619-6000
Fax: (212) 208-6819

Dated: September 12, 2006

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